MATERIAL SAFETY DATA SHEET

SRM Supplier: National Institute of Standards and Technology
Standard Reference Materials Program
Bldg. 202 RM 211
Gaithersburg, Maryland 20899

SRM Number: 1650a
MSDS Number: 1650a
SRM Name: Diesel Particulate Matter
Date of Issue: 07 November 2000

MSDS Coordinator: Joylene W.L. Thomas
Phone: (301) 975-6776
ChemTrec: 1-800-424-9300

FAX: (301) 926-4751
e-mail: SRMMSDS@nist.gov

SECTION I. MATERIAL IDENTIFICATION

Material Name: Diesel Particulate Matter

Description: The basic components of diesel particulate matter (DPM) are elemental carbon, heavy hydrocarbons derived from fuel and lubricating oils, and hydrated sulfuric acid derived from the fuel sulfur. DPM contains a large portion of the polynuclear aromatic hydrocarbons (PAHs) found in diesel exhaust. Diesel particulates include small nuclei mode particles of diameters below 0.04 μm and their agglomerates of diameters up to 1 μm.

DPM is perceived to be one of the major harmful emissions produced by diesel engines. Although there has been a considerable amount of basic research, neither the formation of DPM in the engine cylinder, nor its physical and chemical properties, nor its effects on human health are fully understood. Additional information and research are needed on the methods to monitor diesel particulates and determine the level of risk such particles cause.

> **NOTE:** This material is intended for the purpose of characterizing the risk of diesel exhaust exposure. **It is to be used for research purposes only.**

Other Designations: Diesel particulate matter (DPM), soot

Chemical Formula: Complex mixture

CAS Registry Number: Not available

DOT Classification: Not regulated by DOT

Manufacturer/Supplier: Not applicable

SECTION II. HAZARDOUS INGREDIENTS

Hazardous Component	Nominal Concentration (%)	Exposure Limits and Toxicity Data
Diesel Particulate	100	No occupational exposure limits established*

> **NOTE:** This MSDS is written for whole diesel particulates. For the actual concentrations of PAHs in this material, refer to the corresponding Certificate of Analysis.

*In its 1999 Notice of Intended Changes, the ACGIH proposed a TLV of 0.05 mg/m3 for diesel particulate matter (DPM). The proposed carcinogenicity classification is A2 - " Suspected Human Carcinogen".

SECTION III. PHYSICAL/CHEMICAL CHARACTERISTICS

Diesel Particulate	
Appearance and Odor: fine, black powder	**Vapor Pressure (Air=1/mmHg):** not available
Specific Gravity (H_2O=1): not available	**Viscostiy:** not available
Boiling Point: not available	**Volatiles (% by Volume):** not available
Melting: not available	**Solubility in Water (vol/vol at 0 °C):** not available

SECTION IV. FIRE AND EXPLOSION HAZARD DATA

Flash Point: Not available **Method Used:** Not available **Autoignition Temperature:** Not available

Flammability Limits in Air (Volume %): **UPPER:** Not available
LOWER: Not available

Extinguising Media: Use water spray, foam, dry chemical, or carbon dioxide.

Special Fire Procedures: Fire fighters should wear self-contained breathing apparatus and full protective clothing. Use water to keep fire exposed containers cool. Water may be used to flush spills away from exposures.

Unusual Fire and Explosion Hazards: Not available

SECTION V. REACTIVITY DATA

Stability: **__X__ Stable** **____ Unstable**

Conditions to Avoid: Avoid heat, sparks, and flames.

Incompatibility (Materials to Avoid): Not available

Hazardous Decomposition or Byproducts: Thermal decomposition or burning may produce toxic gases.

Hazardous Polymerization: **_____ Will Occur** **__X__ Will Not Occur**

SECTION VI. HEALTH HAZARD DATA

Route of Entry: **__X__ Inhalation** **__X__ Skin** **__X__ Ingestion**

Health Hazards (Acute and Chronic): Diesel particulate matter (DPM) is perceived to be one of the major harmful emissions produced by diesel engines. Although there has been a considerable amount of basic research, the human health effects are not fully understood.

Workers exposed to diesel exhaust face the risk of adverse health effects ranging from headaches to nausea to cancer to respiratory disease. Studies show exposed workers have an elevated risk of lung cancer. There is some evidence of risk of bladder cancer. Workers also may experience dizziness, drowsiness, headaches, nausea, decrement of visual acuity, and decrement in forced expiratory volume. Laboratory tests have shown diesel exhaust to be toxic, mutagenic*, and carcinogenic.

* For mutagenicity values, please refer to the Certificate of Analysis.

Medical Conditions Generally Aggravated by Exposure: Not available

Listed as a Carcinogen/Potential Carcinogen:

	Yes	No
In the National Toxicology Program (NTP) Report on Carcinogens		X
In the International Agency for Research on Cancer (IARC) Monographs	X*	
By the Occupational Safety and Health Administration (OSHA)		X

The International Agency for Research on Cancer (IARC) reports the following evaluation of diesel engine exhaust:

There is *sufficient evidence* for the carcinogenicity in experimental animals of whole diesel engine exhaust.
There is *inadequate evidence* for the carcinogenicity in experimental animals of gas-phase diesel engine exhaust (with particles removed).
There is *sufficient evidence* for the carcinogenicity in experimental animals of extracts of diesel engine exhaust particles.
There is *limited evidence* for the carcinogenicity in humans of diesel engine exhaust.
There is *limited evidence* for the carcinogenicity in humans of engine exhausts (unspecified as from diesel or gasoline engines). Overall Evaluation: Diesel engine exhaust is *probably carcinogenic to humans (Group 2A)*.

EMERGENCY AND FIRST AID PROCEDURES:

Skin Contact: Remove contaminated shoes and clothing. Rinse affected area with large amounts of water followed by washing the area with soap and water. If irritation develops and persists, obtain medical assistance.

Eye Contact: Immediately flush eyes, including under the eyelids, with copious amounts of water for at least 15 minutes. Obtain medical assistance.

Inhalation: If inhaled, remove the victim to fresh air. If breathing is difficult, give oxygen; if victim is not breathing, give artificial respiration. Obtain medical assistance if necessary.

Ingestion: DO NOT induce vomiting. If ingested, wash out mouth with water. Obtain medical assistance.

TARGET ORGAN(S) OF ATTACK: Not available

SECTION VII. PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be Taken in Case Material Is Released: Notify safety personnel of large spills. Evacuate all non-essential personnel from the area. Remove all sources of heat and ignition. Use appropriate personal protective equipment during clean up. Keep out of watersheds and waterways.

Waste Disposal: Follow all federal, state, and local regulations.

Handling and Storage: To prevent skin contact, wear chemical resistant gloves. Wear safety goggles to prevent contact with the eyes. Remove contaminated clothing and do not reuse until after it has been properly laundered. Eyewash stations and safety showers should be available in areas of use.

> **NOTE:** Contact lenses pose a special problem; soft lenses may absorb irritants and all lenses concentrate them. **DO NOT** wear contact lenses in the laboratory.

Store containers in a cool, dry, well ventilated area.

SECTION VIII. SOURCE DATA/OTHER COMMENTS

Sources: Diesel Net http://www.dieselnet.com
OSHA Priorities – Diesel Exhaust, http://www.osha.gov/oshinfo/priorities/diesel.html
IARC Monographs on the Evaluation of Carcinogenic Risks to Humans and their Supplements, Vol 46, 1989, Diesel and Gasoline Engine Exhausts and Some Nitroarenes, http://193.51.164.11/htdoc/monographs/Vol46/46-01.htm